

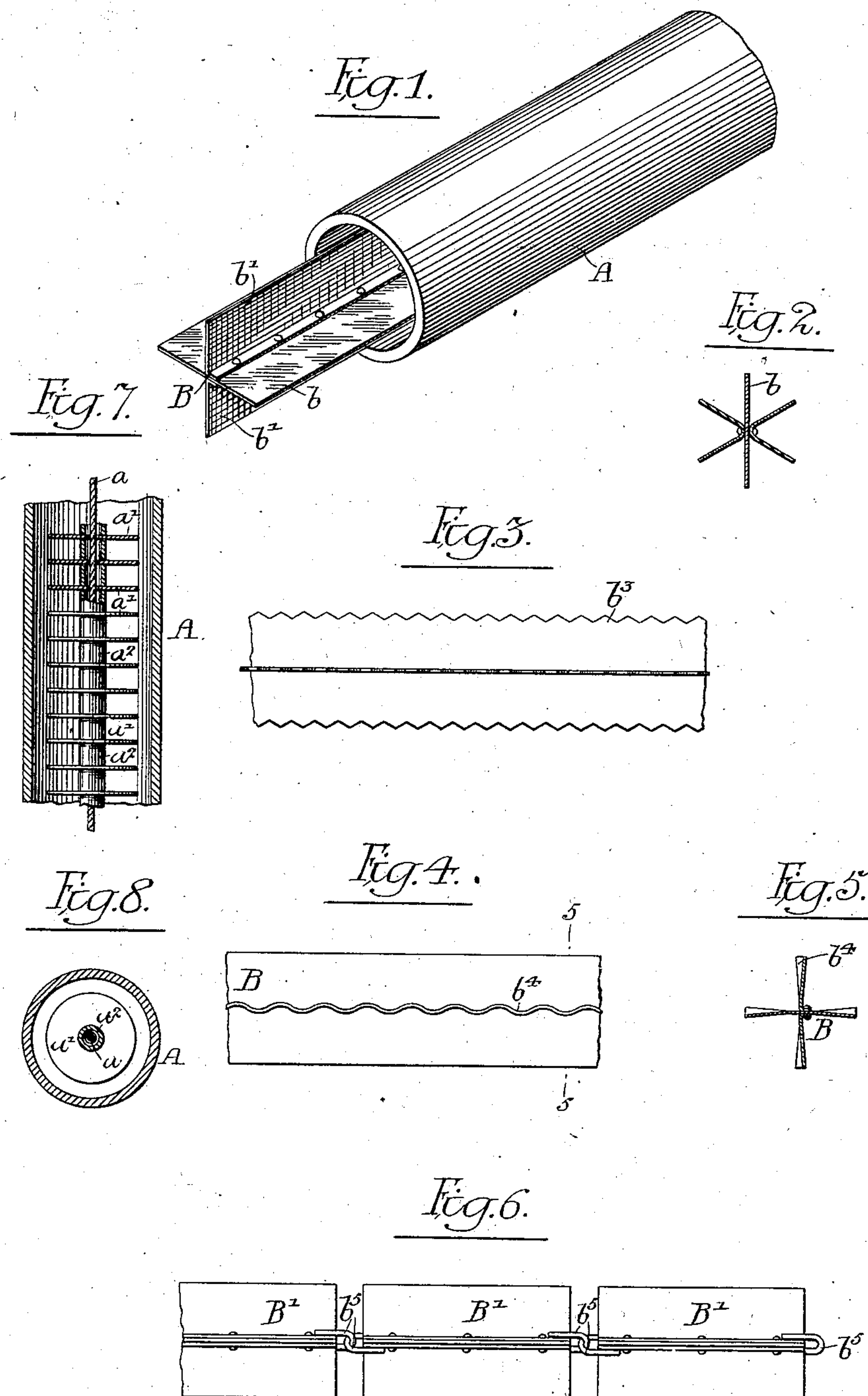
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E. G. RUST.
MECHANICAL WATER PURIFYING DEVICE FOR BOILERS.

APPLICATION FILED APR. 22, 1902.

NO MODEL.



Witnesses:-

Herman E. Mutius.
Frank L. A. Graham.

Inventor:-

Edwin G. Rust,
by his Attorneys,
Howe & Howe

UNITED STATES PATENT OFFICE.

EDWIN G. RUST, OF PUEBLO, COLORADO.

MECHANICAL WATER-PURIFYING DEVICE FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 726,193, dated April 21, 1903.

Application filed April 22, 1902. Serial No. 104,138. (No model.)

To all whom it may concern:

Be it known that I, EDWIN G. RUST, a citizen of the United States, and a resident of Pueblo, Colorado, have invented certain Improvements in Mechanical Water-Purifying Devices for Boilers, of which the following is a specification.

My invention consists in certain improvements in apparatus for purifying water in boilers, having for its object the provision of a device for introduction into a boiler made with a greater or less extent of surface, the same being designed to collect upon itself a certain proportion of the precipitated solids otherwise deposited as scale upon the tubes and other surfaces of the boiler. This object I attain as hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a boiler-tube, showing one form of my mechanical purifier as inserted therein. Fig. 2 is a vertical sectional view of a slightly-modified design of my device. Figs. 3 and 4 are side elevations of other forms of my invention. Fig. 5 is a vertical sectional view on the line 5-5 of the form of the device illustrated in Fig. 4. Fig. 6 is a form of my invention designed for use in curved water-tubes or in boilers where it is not convenient to introduce a single long section. Fig. 7 is a vertical sectional view of a boiler-tube, showing a modified form of my invention in position therein; and Fig. 8 is a sectional plan view of the construction shown in Fig. 7.

In the above drawings, A represents a tube of a water-tube boiler in which are placed two elongated sheets of metal joined so as to form a single element B, as shown. The preferred construction consists of a thin sheet b , of iron, to which are riveted two other sheets b' , so as to project at an angle to the surface thereof, the whole element being cross-shaped in section. If desired, the surface of said element may be increased by forming it in the manner indicated in Fig. 2, where two elongated sheets are each bent into a V-shaped section and riveted together and to the piece b to form a star-shaped section. By serrating the edges of the sheets making up the element, as illustrated at b^3 in Fig. 3, or by corrugating the

surface of the sheets, as indicated at b^4 in Figs. 4 and 5, I may still further increase the surface of my device.

In boilers having vertical or inclined water-tubes a form of my device similar to that shown in Figs. 7 and 8 may be advantageously employed. This consists of a metallic cable a , on which are strung disks a' , having between them spacing-pieces a^2 , formed of short sections of tubing, the whole being suspended within the boiler-tubes and periodically removed for cleaning.

In operation one of the elements of any of the forms above described is introduced into each tube of a water-tube boiler, and being surrounded by the same body of water which bathes the inner surface of the tubes it naturally has deposited upon it a scale of practically the same thickness as that deposited on the tubes, thus freeing the water of an amount of scale-forming material or solid matter in direct proportion to the amount of surface of the said elements. There is thus deposited upon the device a certain amount of scale which would otherwise certainly have been deposited upon the tubes or sides of the boiler, it being of course understood that the said device is of such dimensions as will leave it sufficiently free and loose inside of the tubes to permit of its easy insertion and removal. When the boiler is opened for cleaning, these mechanical purifying devices are taken out and the scale removed by striking their flat surfaces with a hammer or by any other desired method. The devices are then again inserted in the tubes and the boiler is put in service for a length of time depending upon the nature of the water used and the work required, after which the cleaning operation is repeated.

While, as before noted, the device may be and is preferably constructed of thin sheet metal, either rolled to a particular shape or made up of bent elements riveted together, it will be understood that in some cases I may use relatively short sections, as shown in Fig. 6, these being linked or joined together, so that they may be inserted in bent tubes or may be taken inside of the boiler through a manhole or other small opening. In this figure it will be seen that the small sections B' are each provided with hooks b^5 , which after

being made to engage with each other, as shown, are bent down, so that they will not become detached.

It will be seen that by the use of the corrugated plates illustrated in Fig. 4 I form what is practically equivalent to a series of pockets in the horizontal members of the device, which serve to collect and retain the scale even better than do the plain forms illustrated in the other figures.

It is known that there are various substances—such as cement, lime, &c.—which when applied to any particular point in the interior of a boiler tend to accelerate the deposit of scale at that point, and I may, if I desire, coat the surfaces of the various elements constituting my improved water-purifying device with some of the above substances in the form of a wash, and thereby materially assist and increase the deposit of scale upon the surfaces thereof.

It will of course be understood that there are a number of forms other than those illustrated in the drawings which my device may take without departing from the essential feature of the invention, which contemplates the introduction into the interior of a boiler, tubular or otherwise, of a removable device having a relatively extended surface for the reception of scale deposited from the water within the boiler, the surface of said device being coated, if desired, with some substance tending to accelerate the deposit of scale thereupon.

I claim as my invention—

1. The combination with a boiler, of a device removably inserted therein, the same consisting of a series of independent units each composed of a plurality of plates of metal joined in intersecting planes and loosely fitted within the water-space of said boiler, said plates being corrugated and thereby forming

an extended surface for the deposition of scale from the water in the boiler, substantially as described.

2. The combination in a boiler, of a device removably inserted therein, the same consisting of a plate of metal having fixed to it another plate or plates, said latter plates projecting at an angle from the surface of the first plate and the whole being loosely fitted within the water-space of the boiler thereby forming an extended surface for the deposition of scale from the water in said boiler, substantially as described.

3. The combination with a boiler, of a scale-receiving device, the same consisting of a plurality of plates movably connected to one another and extending in planes parallel to the line of said connection, the said device being removably inserted within the water-space of the boiler, substantially as described.

4. The combination with a boiler, of a scale-receiving device, the same consisting of a body or bodies removably placed within the water-space of the boiler provided with a coating of a substance tending to accelerate the deposit of scale thereupon, substantially as described.

5. The combination with a boiler, of a scale-receiving device, the same consisting of a series of elements each composed of a plurality of plates rigidly fastened together, the said elements being movably connected to each other and removably inserted within the water-space of the boiler, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN G. RUST.

Witnesses:

AXEL H. HELANDER,
HENRY B. RUST.